



Planning Tool Suite – getCal; various & sundry

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IAU Working Group Mtg 21 July

Outline



- Introduction to the getCal Suite
- Key Features
- Design Overview
- Illustrative Use Cases
- Installation/Dependencies
- Common Calibrators Catalog
- Supporting IAU WG Data Format
- Wrap-Up



Introduction to the getCal Suite

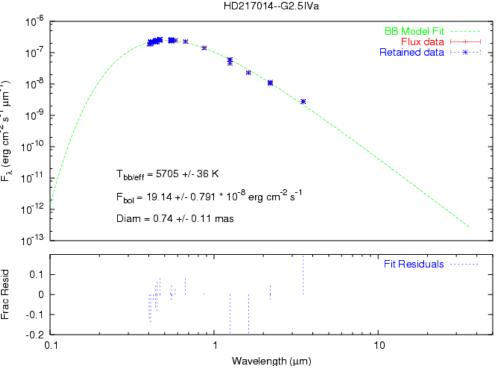
- getCal is a PTI-heritage Interferometry Experiment Planning Tool That Assists User in Composing an Observation Plan
- Designed With Wide (Unix) Portability in Mind (with web interface for non-Unix platforms)
- Implemented as Numerous Small Components; Interface Either Through Top-Level Glue-Scripts and GUIs or Directly With Components

Attributes of a Good Calibrator?



- Attributes of a "Good" Visibility Calibrator:
 - Unresolved (minimally resolved)
 - "Apparently" Single/Simple
 - Bright (or similar to target)
 - Similar observing geometry to target (near in sky)
 - Known size, or Properties leading to reliable size estimate
- Identifying Good Calibrators
 - > Geometric search
 - > Astrophysical constraints
 - > Angular diameter estimation \(\frac{\bar{n}}{2} \)
 - Spectral energy distribution modeling
 - Ancillary information (e.g. Simbad classification &

21 July 20 measurements, IR (2Mass) photometry)



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getCal is an Experiment/Observation Planning Tool That:

- > Resolves astronomical designations into standardized catalog entries and astrometry (via Simbad)
- > Identifies potential visibility calibration sources according to various observational and/or astrophysical criteria
- Retrieve broad-band photometry from archival (Simbad, Catalog of Infrared Observations, *2Mass*) sources and model spectral energy distribution (SED) with effective temperature/bolometric flux/angular diameter parameters
- Computes observing accessibility and geometry according to various constraints (annual, nightly, u-v tracks)
- > Various GUIs that facilitate access to components, including new webbased interface (to roll-out soon)
- > Interfaces to KI Control Components
 - Composes KI "Astronomical Observing Template" (AOT)
 - Keck "sky" planning application

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User Interface

getCal Design Overview

- getCal is designed as multi-layer toolset
 - > GUI level GUIs that interface with command-line tools the facilitate interface or present results (e.g. gcGui, tGui)
 - > Wrapper level top-level scripts that provide consolidated functionality with command-line interface (e.g. getCal, gcList)
 - Component level individual components that implement individual functions (e.g. Hipparcos catalog "cone search", Simbad name resolution & information retrieval, accessibility calculations)
- Script (perl) implementation to enhance portability

gcGui tGui getCal fbol timing SimbadQ

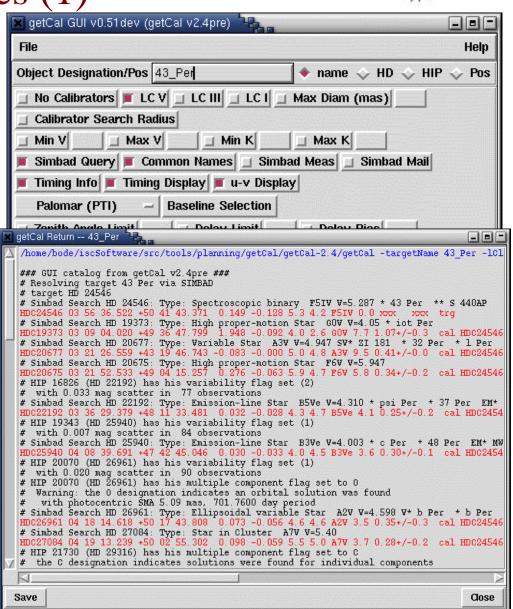
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Illustrative Use Cases (1)

- Identify CandidateCalibrators for GivenSource
 - Geometric search
 - > Magnitude constraints
 - Astrophysical constraints
 (e.g. luminosity class,
 apparent diameter)
 - Multiplicity vetting



Illustrative Use Cases (2)

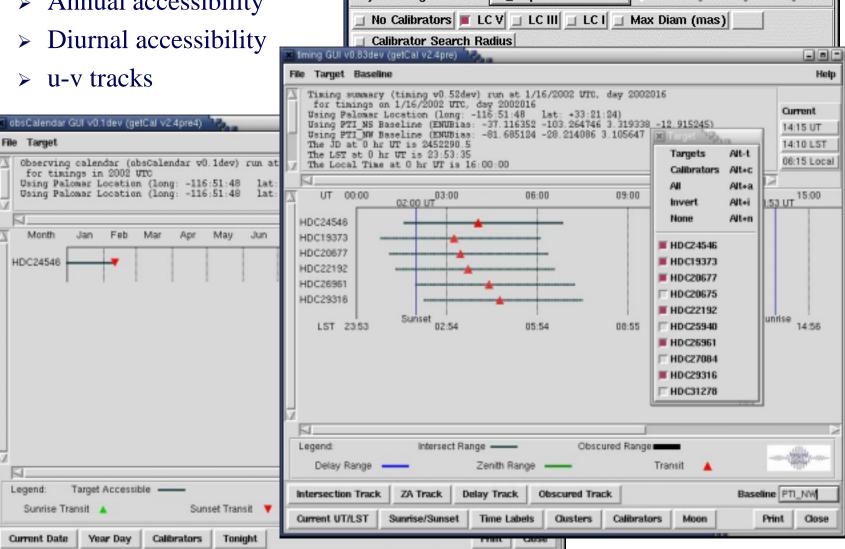


name 🔷 HD 🔷 HIP 🔷 Pos

Help

Accessibility calculations

> Annual accessibility



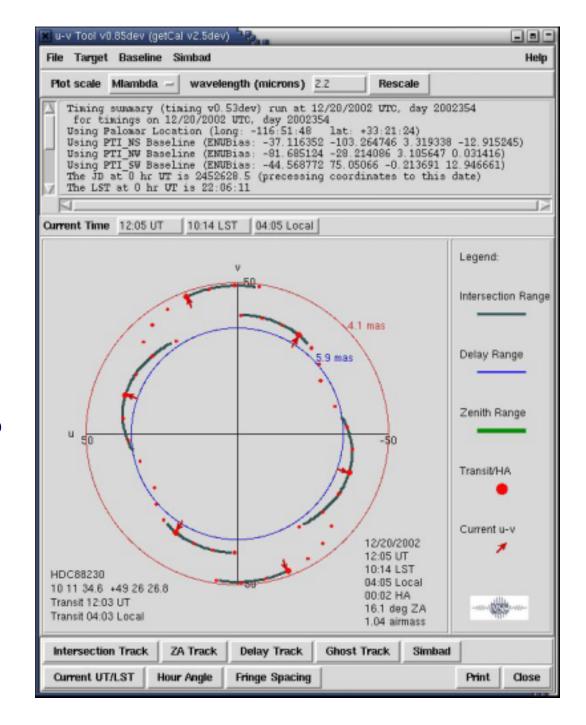
getCal GUI v0.51dev (getCal v2.4pre)

Object Designation/Pos 43_Per

u-v Tracks

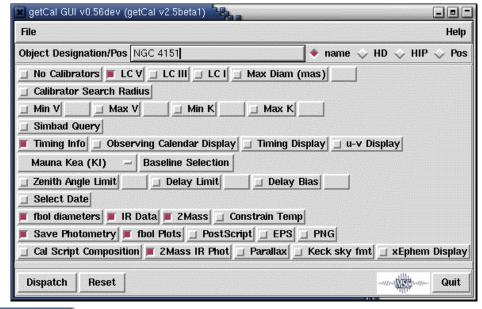
All Accessibility GUIs:

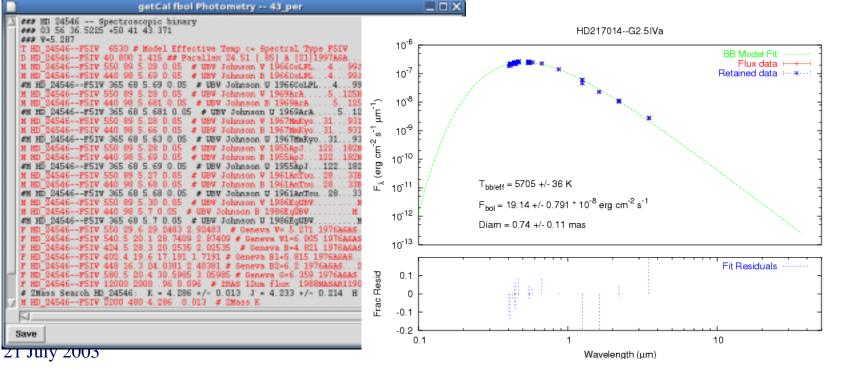
- Provide real-time information (UTC, local time, and track position)
- Output hardcopy to PostScript and bitmap formats



Illustrative Use Cases (3)

Spectral Energy
 Distribution/Bolometric
 flux – effective
 temperature modeling



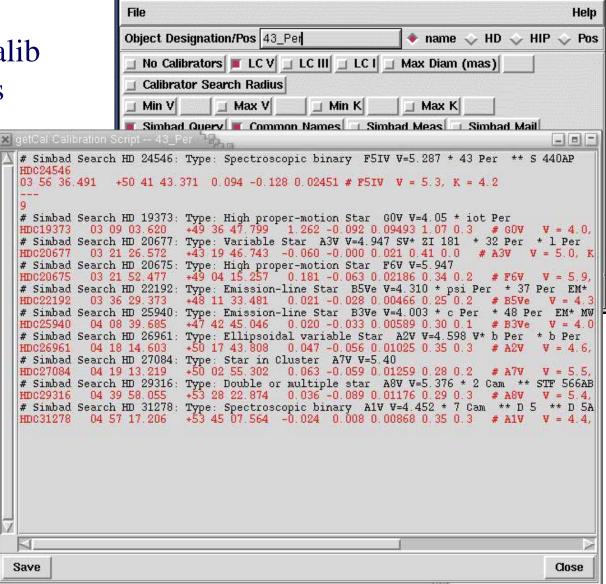




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Illustrative Use Cases (4)

Composing wbCalib calibration scripts

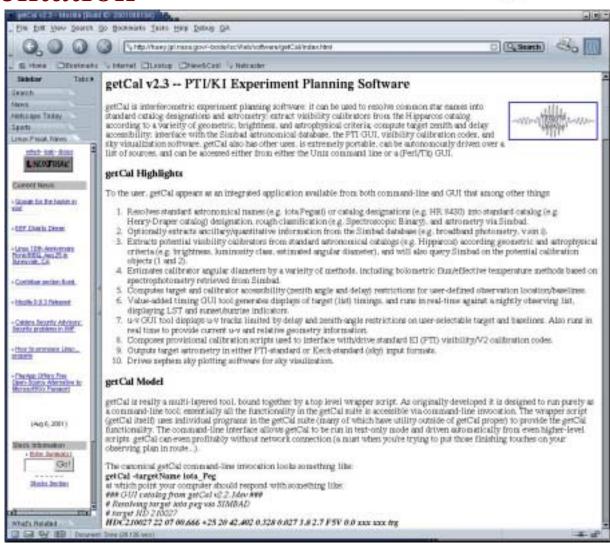


getCal GUI v0.51dev (getCal v2.4pre)



getCal Documentation

- getCal
 documentation
 is on-line at
 msc.caltech.edu
- getCal is freely available through the MSC download portal
- webGetCal will be available in the fall



http://msc.caltech.edu/software/getCal

getCalWeb

- Not complete vaporware...
- Coming to a URL near you in September.

getCal gcGui msc.caltech.edu _ = X Bookmarks Tabs Help Edit View <u>W</u>eb Go 血 https://iscdev304.ipac.caltech.edu:5000/getCal/visiter/temp-1015664472/tim Stop Refresh Home 较 Internet 🗀 Lookup 🗀 New&Cool 较 Netcaster 🗀 DemoFolder 较 CNN.com 较 New York Times 较 Los Angeles Times Goodle Google « GOOGLE « Dictionary « getCal gcGui Web Query The form on the left is the on-line version of the getCal interface gcGui. The Examples drop down menu enables you to select from a number of examples that provide pre-selected values as input. Press Submit to activate the query. After a moment, the textual result will appear in the frame on the right and graphical results will appear in the bottom frame. Examples | query star by name iota peg Submit Help | getCal Documentation | ▼ getCal executed with ☐ Max V ☐ Min K ☐ Max K getCal -targetName iota peg -fbol -longWL -savePhotometry -plots -hc -ps -timing -obsCal -location PTI Simbad Query -noCal Common Names Simbad Meas Browser ocGui -pna tGui -png Simbad Mail Query Processing ... 🗹 Observing Calender display 🗹 Timing display 🔲 t HD 210027--F5V.sed.png NONE Fbol Output PTI NS Photometry Output PTI NW Observing Calender Palomar (PTI) PTI_SW Zenith Angle Limit ☐ Delay Limit Timing Display ▼ 17 ▼ 2003 ▼ Select Date July ✓ fbol diameters ### GUI catalog from getCal v2.5beta1 ### V IP Data V 2Macc C Constrain Town V Sava Ph.

✓ Recelving target into peg via SIMPAD III 0000 05:00 00:80 1500 03:00 12:00 11:47 UT 03:59 UT HDC:210023 LST 11:54 14:54 17:55 2055 7/18/2003 UTC, day 2003199 Baseline: Composite Intersection Track 35 deg zenith angle constraint 38.3 m delay constraint Produced by 1ming GUI v0.9dev (getCal v2.5beta1) Done.

21 July 2003



getCal Installation & Dependencies

- getCal build/installation recipe:
 - > install.getCal shell script that prepares components
 - install.extern shell script that makes external symLinks into convenient path location (e.g. /proj/msc/mscSoftware/bin, /usr/local/bin)
- getCal dependencies
 - > Perl 5 (e.g. 5.005, 5.6.1)
 - > Perl/Tk (800 series)
 - > Hipparcos catalog and annexes
 - > Lynx (for Simbad and 2Mass access via HTTP)



getCal Coming Attractions

- Interface getCal to additional catalogs (including common calibrator catalog format)
- Add long delay line (LDL) position optimization tool
 - > Users can see and optimize LDL position for individual objects or experiment clusters
- Rework build & install procedures in a more standard (i.e. GNU Autotools) methodology
- Visibility modeling/visualization application...

Proposed: Common Calibrators Catalog

- MSC is notionally committed to supporting communitywide common calibrators catalog
- ➤ PTI is "about to" make a substantive contribution to this in the form of catalog of ~275 PTI calibrators we have used over the years (forthcoming Lane & Creech-Eakman 2003)
 - > Diameter estimates based on PTI data and/or SED modeling
 - > 2.5 < K < 5
- Propose to work with ESO (Richichi) & NEVEC (Percheron) to unify calibrator sets into an integrated catalog, and make that catalog available through MSC and ESO distribution mechanisms (e.g. download portal)
- Integrate into getCal search infrastructure



Common Data Format Support

- MSC is committed to supporting IAU WG-Sponsored Data Exchange Format (Pauls & Young) in calibrated data
 - > Particularly critical given demise of AIPS++ consortium
 - > Best way to do that is to be producing leading the user community by producing data products in this format
- Versions of KI V2 calibration applications that produce data in this format will be available in October
 - Version exists now in testing; library packaging issues need to be addressed